APPENDIX D

FLIGHT ACTIVITY FORECAST DEVELOPMENT

Contents

D.1 INTRODUCTION

Aviation activity forecasts were prepared for 15 airports located within the Cleveland & Detroit Terminal Radar Approach Control (TRACON) regional airspace redesign study area, as shown in **Table D-1**. This list of airports includes the two primary airports in the region, CLE and DTW, as well as 13 secondary or satellite airports. The list of satellite airports includes those airports in the region at which at least 10 IFR operations, on average, occurred per day during the 75-day selected period in the radar data sample. Additionally, Selfridge Air National Guard Base (MTC) was included because, although it averaged only nine operations a day, many of the operations at MTC are military tactical fighter jet aircraft and large four-engine turboprop aircraft. Operations at Mansfield Lahm Airport (MFD) also fell below the 10 operations a day cutoff during the 77 day radar period, but historic radar data appears to indicate that operations at MFD fluctuate over the course of the year and, on an annual basis, average out to nearly 10 IFR operations per day. For this reason, coupled with the fact that approximately half of the operations at MFD are jets and that MFD has a terminal radar approach control, MFD was included in the study.[1]

Table D-1
Forecasted Airports

Airport Name	Airport	Type of Service
Cleveland Hopkins	CLE	SP,GA,CG,NSP,ML
Detroit Metropolitan	DTW	SP,GA,CG,NSP,ML
Akron/Canton	CAK	SP,GA,CG,NSP,ML
Toledo	TOL	SP,GA,CG,NSP,ML
Flint	FNT	SP,GA,CG,NSP,ML**
Windsor, Canada	YQG	SP,GA,CG,NSP
Willow Run	YIP	GA,CG,NSP,ML**
Burke Lakefront	BKL	GA,CG,NSP,ML
Cuyahoga County	CGF	GA
Ann Arbor Municipal	ARB	GA
Detroit City	DET	GA,CG,NSP,ML**
Oakland County	PTK	GA,CG,NSP,ML**
Oakland/Troy	VLL	GA

[1] Per email from Michael T Johnson, Northrop Grumman Information Technology, dated 11/8/04.

Table D-1 Forecasted Airports		
Airport Name	**Airport**	**Type of Service**
Selfridge ANGB	MTC	MIL
Mansfield Lahm	MFD	GA,NSP,MIL
* Scheduled passenger (SP), general aviation (GA), cargo (CG), air taxi/charter (NSP), and military (ML).		
** Radar and ATADS data indicate that these airports had some military activity in 2004; however, this activity amounted to less than 1 operation per day when operations data was converted to average annual day and, therefore, no military operations appear in the event files for these airports.		

The forecasts prepared for this task include all Instrument Flight Rule (IFR) aviation activity. Aircraft operating under Visual Flight Rules (VFR) were not included in this forecast effort. Three event files (schedules of aircraft operations), reflecting average annual day activity (AAD), were prepared for each of the fifteen airports: a base year (2004) event file and two future event files representing 2006 and 2011.[2] Additionally, overflights within the terminal airspace were also forecasted.

The purpose of the forecast is to provide input data with which to analyze the operational and environmental impacts of existing and projected levels of operations. This document provides information on the data sources and methodology used to develop the forecasts and event files for 2004, 2006, and 2011.

Forecasting is not an exact science; deviations from the relied upon economic forecasts or the current airline business environment may affect the projections presented herein.

D.2 KEY ASSUMPTIONS

The forecast presented herein are based upon the following key assumptions:

Aviation Security - Security issues related to air travel have changed and will continue to change as new security procedures and technology are incorporated to improve airport security. Future events that may affect traveler confidence in airport security or air travel security cannot be predicted. It is assumed that there will be no terrorist attacks during the forecast period that will affect confidence in the aviation system to the same extent as 9/11. It is also assumed that the Transportation Security Administration (TSA) and associated security costs and requirements will continue through the forecast period.

[2] Event files include all operations performed by all segments of aviation – passenger, cargo, general aviation, air taxi, and military flights and include the following information about each flight: type of operation: arrival or departure; time of operation: time of arrival or time of departure; airline (except general aviation and military flights); equipment type; origin for arrivals and destination for departures.

Economic Assumptions - The forecasts assume no major economic downturn, such as occurred during the depression of the 1930s. Local, national, and international economies will periodically increase and decrease the pace of growth in accordance with business cycles. However, it is assumed that, over the forecast term, the high- and low-growth periods will offset each other.

Regional Airport Trends - The basic character of each of the study airports will not change during the forecast period. For example, airports with only general aviation (GA) activity will remain GA-only airports whereas airports with commercial service will retain this service through the forecast period. Additionally, no new commercial service airports will be constructed in the region during the forecast period.

Air Service Trends - Factors such as government regulation and labor union resistance are assumed to prevent any major airline consolidation. Although some minor airline consolidation and alliance development could occur, no attempt is made to predict the individual airlines that would be affected, except as noted. Additionally, no return to airline regulation, as occurred prior to 1979, is assumed.

Capacity Constraints - All airports included in the forecasts are assumed to have no constraints on any growth in aircraft operations for the duration of the forecast

Time Distribution - The time of day distribution of operations in each category is assumed to remain constant over the forecast period.

Aircraft Size and Load Factor - It was assumed that the load factor at each airport will increase at the same rate as the FAA forecast for the U.S. Average aircraft size was estimated using load factor, operation, and enplanement projections.[3] Similar to operations, future enplanements were projected by applying the TAF enplanement growth projections to 2004 enplanement estimates from each airport. The future fleet will be estimated based on the fleet plans of the major carriers serving each airport.

Fuel Costs - The real cost of fuel is assumed to increase gradually, in accordance with FAA forecasts. The FAA forecast assumes volatility with oil and gas prices in the short-term but then a steady increase over time. No major price shocks or disruption, as occurred in the mid- and late 1970s, are assumed. Also, no major increases in fuel taxes are assumed.

Hub-and-Spoke Effects - No significant change in the hub-and-spoke system is foreseen in the forecast period. However, new routes and new service points will continually be developed as markets expand and as new carriers appear, new marketing niches develop and other events affect the travel market.

[3] Average aircraft size was estimated by first projecting seat departures (enplanement projections/load factor) and then dividing seat departures by projected departures. Base year seat departures were estimated from OAG data.

D.3 DATA SOURCES

Official Airline Guide (OAG), 2004—The OAG provides detailed information about scheduled airline activity in the region, such as aircraft type, flight arrival and departure times, service frequency, and city-pairs. It was used to develop baseline and future scheduled passenger activity at those airports with commercial service.

Terminal Area Forecasts (TAF)—The most recent TAFs, published in February of 2004, were downloaded from the FAA website. TAF growth rates, where available, were used to project future operation levels at each airport.

J. P. Airline Fleets, 2004-2005—J.P. Fleets provides information on existing airline fleets and projected aircraft orders and options. It was used to help develop the future fleet mixes for the carriers serving each airport.

FAA Aerospace Forecast, 2004-2015, March 2004—The Aerospace Forecast was used to estimate changes in load factor and average aircraft size. It was also used to project future GA fleets at each of the fifteen airports.

Air Traffic Activity Data (ATADS)—Instrument operations as recorded by ATADS were downloaded from the FAA website and used to annualize the radar data. The FAA defines ATADS as the official source of historical air traffic operations for center, airport, instrument and approach counts.

Radar Data—The event files were developed, in part, using radar data which includes all IFR operations recorded at the Cleveland ARTCC (ZOB) over a 77 day period in 2004—31 days in March, 31 days in July, and 15 days in April. Each operation category (i.e. GA, cargo etc.) in the radar sample was annualized separately using annual IFR operations as recorded by FAA ATADS. The process used to annualize each component of operations varied slightly and is described below in the component specific sections of the report.

All arrival and departure times in the radar data are in Greenwich Mean Time (GMT) and were converted to Eastern Standard Time (EST), taking into account Daylight Savings Time. Microsoft Access was used to isolate only those flights in the radar day that either arrived or departed from one of the airports in the study. Next, duplicate flights in the radar data were flagged and each flight was assigned to a category (i.e. scheduled passenger, cargo, air taxi/charter, GA, and military). For the purposes of this forecast, air taxi/charter operations are defined as "on demand" non-scheduled passenger flights, including those that are operated by charter air carriers such as Ryan Air and USA 3000. Small cargo "feeder" flights were classified as cargo operations.

U.S. DOT T-100 Data—This data is reported by the airlines to the U.S. DOT and includes information on scheduled and non-scheduled passenger and cargo flights, such as the number of operations by airline, aircraft and market. The T-100 data was used to crosscheck and supplement the radar data.

D.3.1 Base Year (2004) Estimates

Base year operations levels were estimated using 2004 year-to-date (YTD) ATADS data, 2004 YTD T-100 data, and annual 2004 operations as published in the OAG. ATADS data was available for most airports in the study through November 2004 and was extrapolated to a full 12-month year.[4] Domestic T-100 data was available through October 2004 and was extrapolated to a full year in the same manner. International T-100 data was only available through July 2004 and also was extrapolated using monthly data from 2003.

Growth in total operations from 2004 to 2006 was based on growth rates, rather than operations levels, from the most recent TAF (February 2004).[5] For example, growth in operations between 2004 and 2006 was estimated by applying the TAF 2004-2006 (FY) growth to estimated 2004 IFR operations. Similarly, growth in operations between 2006 and 2011 was estimated by applying the TAF 2006-2011 (FY) growth rate to the estimated number of 2006 operations. The individual categories of airport activity—scheduled passenger, all-cargo, general aviation, air taxi/charter, and military—were each grown at their respective TAF growth rates and adjusted slightly to sum to the estimated number of total operations as calculated above.

D.4 OPERATIONS FORECASTS

D.4.1 Scheduled Passenger Operations Forecasts

Currently, six of the fifteen airports in the study have commercial service/scheduled passenger service: CLE, DTW, CAK, TOL, FNT, and YQG.

The 2004 scheduled passenger event files were built from an annual 2004 OAG schedule—converted to average annual day by dividing annual operations by 365 and adjusted by a completion factor (see following assumption)—and the base year event file was then used as the foundation for the 2006 and 2011 event files. Additionally, an OAG flight schedule for a "typical day" was used as a source for scheduled flight arrival and departure times. The flight times in the "typical day" schedule were applied to the 2004 average annual day event file.[6]

Overall seat departures for each airport with commercial service were projected using the enplanement growth from the TAF and load factor projections from the FAA's *Aerospace Forecast, 2004-2015*[7] . The *Aerospace Forecast* includes only national level estimates and it was assumed that load factors at each of the study airports would grow at similar rates as the national

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4 Methodology used to extrapolate ATADS data: [(2004 operations January through November) / 1-(December 2003 operations / 2003 annual operations)].

5 Growth rates, rather than operations levels, from the TAF were used because the TAF was published in Feb 2004 and the base year event files for 2004 relied on actual, rather than forecasted data. Operations levels at some of the study airports diverged from the 2004 operation estimates in the TAF; therefore TAF growth rates were applied to actual 2004 operations.

6 The "typical day" schedule was pulled for Wednesday September 22, 2004. An analysis of ATADS data determined that the number of aircraft operations on this day most closely resembled the annual number of operations divided by 365.

7 See Table 10 in FAA *Aerospace Forecast*, 2004-2015.

average (i.e., nation wide growth applied to airport specific load factors in 2004). Based on the *Aerospace Forecast*, load factors for mainline carriers grow at slower rate than for regional carriers. Seat departure projections were used to calculate average aircraft size.[8]

Departures forecasts for 2006 and 2011 were then developed for each airport using the estimates of seat departures, average aircraft size, and aircraft operations along with announced fleet plans for each of the airlines. The departures forecasts included AAD aircraft departures by market, airline, and aircraft type. The development of the departures forecasts were guided by seat departure and average aircraft size projections. For example, if the fleet mix had too many aircraft departures but not enough seat departures, this would indicate that the fleet mix included too many small aircraft. Conversely, if the fleet mix had too many seat departures and not enough aircraft departures, this would indicate that the fleet mix had too many larger aircraft.

In addition, development of the scheduled passenger portion of the event files was based on a number of assumptions, including:

The Northwest Airlines (NWA) hub in DTW and the Continental Airlines (COA) hub in CLE will remain traditional hubs. Additionally, established hubs at other airports will continue to exist through 2011 and no new hubs are projected over the forecast period.

Peaking characteristics in 2006 and 2011 will be similar to those that existed in 2004.

Any published carrier that served CLE or DTW in 2004 will continue to operate at these airports for the duration of the forecast. Legacy carriers in bankruptcy, such as United and US Airways, and new carriers without a long history, such as Independence Air, are assumed to continue to exist into the future.

Schedule mainline flights, as published in the OAG, are assumed to have a completion rate of 99.5 percent and commuter flights are assumed to have a completion rate of 98.5 percent.[9]

Seat departures for hub-carriers (NWA at DTW and COA at CLE) will grow faster than seat departures for non-hub carriers. See non-stop market overview below.

Over the forecast period, NWA and COA are assumed to continue to serve all of the markets to which they offered non-stop service from DTW and CLE in 2004.

Non-hub carriers are assumed to continue to serve the markets that they served in 2004 but are not expected to serve any new destinations over the forecast period.

Jet Blue will be the only new carrier to offer service at the study airports with scheduled flights between CLE and JFK and DTW and JFK using Embraer 190s beginning sometime between 2006

[8] Average aircraft size is calculated by dividing scheduled passenger seat departures by scheduled passenger operations.

[9] Continental mainline completion factor was 99.2% for CY2003, 99.6% for Year to Date August 2004; Continental Express had completion factor of 99.4% in October 2003, 98.5% for Jan-June 2004, 98.8 % in July 2004, and 97.2% in August 2004.

and 2011. AirTran is assumed to focus their market development in Flint and Akron/Canton and not to offer service at additional airports in the study area.

D.4.1.1 Non-stop Market Overview

In 2004, NWA, and its commuter carriers, provided a record 78.7% of scheduled passenger seats departures at DTW and this share is expected to increase only slightly, to about 79.3% by 2011. Similarly, Continental and its commuter carriers provided a record 59.4% of scheduled passenger seats departures at CLE in 2004 and their share of seat departures is expected to increase to 60.7% by 2011.

A percentage share approach was used to estimate growth on a market by market basis and separate seat departure forecasts were developed for hub and non-hub carriers. As an example, NWA seat departures from DTW to LGA, as a percent of total NWA seat departures from DTW, grew from 2.4 percent in 1999 to 2.5 percent in 2004, while the percent of NWA seat departures from DTW to GRR grew from 1.6 percent to 1.8 percent over the same time period. LGA is one of the largest business travel markets in the nation, and GRR is a large regional business market in Michigan. On the other hand, the percentage of seat departures from DTW to MCO and TPA, two of the largest leisure markets in the nation, declined between 1999 and 2004. Based on the historical market share trend, it is assumed that the percentage of seat departures to LGA and GRR will increase over the forecast period while the percent of seat departures to MCO and TPA will decline over the forecast period. A similar analysis was conducted to develop seat departure projections at CLE on a market by market basis. Seat departures at FNT, TOL, CAK, and YQG, were assumed to grow at the same rate across all non-stop markets but service from these airports to CLE and DTW were made to mirror those in the CLE and DTW event files.

D.4.1.2 New Non-stop Markets

Between 1999 and 2004, NWA added service to 35 non-stop markets from DTW. In September 2004, 29 of these markets were served with daily nonstop flights from DTW while the remaining six markets were served only seasonally from DTW.

Nearly all of the new 35 markets also have service to ORD (an American Airlines and a United Airlines hub) and CVG (a Delta Airlines hub). American and United service at ORD and Delta service at CVG was analyzed in order to identify possible new NWA non-stop markets at DTW. For example, NWA is most likely to offer new service from DTW to markets that currently have nonstop service to either ORD or CVG but that do not have non-stop service to DTW. Seat departure benchmarks were developed to estimate when service to these new markets is likely to begin. For example, in 2004, there were 482,000 annual seat departures from ORD to SJC—the highest number of seat departures from ORD to a market that NWA does not serve from DTW. Similarly, there were 283,656 annual seat departures from ORD to SMF in 2004—the second highest number of seat departures from ORD to a market that NWA does not serve from DTW. Based on this analysis, SJC and SMF were identified as the two markets to which NWA is most likely to begin non-stop service from DTW.

As mentioned previously, NWA has added new service to an average of seven new markets per year since 1999 (35 new markets over 5 years). With the addition of regional jets to their fleet,

NWA has added service to many markets that are too far from DTW for turboprop service but that had insufficient traffic to warrant mainline service from DTW. However, the majority of these "in between" markets are now served with regional jets from DTW; therefore, it is assumed that NWA will only add an average of three new markets per year at DTW between 2004 to 2006 and an average of only two new markets per year between 2006 to 2011.

Seat departures from DTW to international markets are expected to grow more quickly than seat departures to domestic markets with the largest increase in seat departures to Asian and Canadian markets. Over the forecast period, it is assumed that NWA will add service to Beijing (service ceased in 2002) and Hong Kong from DTW. However, it is assumed that NWA will not add service to any new European markets from DTW.

New non-stop markets at CLE were identified in a similar fashion. An analysis of OAG data indicates that between 1999 and 2004 COA added service to 14 new non-stop markets from its hub in CLE. As of September 2004, COA still offered non-stop service to 10 of these 14 markets, the majority of which are served by either regional jets or turboprops. It is estimated that COA will add, on average, one new non-stop market at CLE per year over the forecast period and that the majority of these markets will be within regional jet range (within 1,250 statute miles of CLE). The number of international seat departures from CLE is expected to increase slightly faster than the number of seat departures to domestic markets but no new international markets are expected at CLE for the duration of the forecast.

D.4.1.3 Scheduled Passenger Fleet Forecast

One of the most pronounced changes in commercial passenger fleets in recent years has been the replacement of turboprop aircraft with regional jets. The continued growth in regional jet use is expected to drive an increase in the average seating configuration of regional airline markets.

Excluding DC-9s, the average age of the NWA's mainline fleet is only about 10.5 years and NWA has not yet announced a replacement plan for their DC9s, full implementation of which would likely take longer than 6 years (end of forecast period) and require a significant financial investment. Over the next few years, NWA is expected to retire some of their older DC-10s as their new Airbus A330s enter service, but overall, their mainline fleet is assumed to remain fairly stable through 2011.

NWA and its commuter airlines (collectively, Northwest Airlink), have acquired a substantial number of Canadair Regional Jets (CRJs) in recent years and, as of June 2004, had more than 100 CRJs in service and another 28 on firm order. The Northwest Airlink fleet also includes 49 Saab 340 (SF34) turboprops and 35 Avro RJ85 regional jets. The average age of the SF34 and the RJ85 aircraft is 6.6 and 5.7 years, respectively, and it is; therefore, assumed that most of these aircraft will remain in the Northwest Airlink fleet for the duration of this forecast.

Assuming that an agreement between the NWA and the pilots union can be reached, NWA is expected to begin operating some new 70-seat regional jets before 2011.

The COA mainline fleet is expected to experience most of it growth in next generation Boeing 737s such as the B737-700, B737-800, and the B737-900. COA is expected to retire all of their MD80s by the end of 2005. The Beech 1900s are expected to disappear from the COA commuter

fleet by 2011 while the majority of growth in the commuter fleet will come in the form of Embraer-145 regional jets (E145) while the number of ERJ-135 (E135) seat departures is expected to slowly decline due to their relatively high seat mile cost.

American Airlines ceased mainline service to CLE in 2004 and is expected to service CLE with an increasing number of E145s and larger Canadair RJ-700s (CRJ7). Delta is also expected to operate an increasing number of CRJ7s and retire their B737-200s by 2011. United's mainline fleet is expected to remain fairly constant, whereas US Airways is expected to operate a larger number of Airbus 319s (A319) at both CLE and DTW as they begin to retire their fleet of older B737-300s and B737-400s.

D.4.2 General Aviation Activity

The general aviation activity forecasts were based primarily on radar data and ATADS data (i.e., the actual number of instrument operations recorded by ATADS for each airport).[10]

As mentioned previously, ATADS data was available for most of the study airports through November of 2004 and was extrapolated to a full year using monthly 2003 data. Once extrapolated to a full year, the 2004 annual ATADS data was used to annualize the radar data for GA operations. For those airports for which ATADS data was not available, annualization factors from comparable airports were used to annualize the radar data. For example, the annualization factors from ARB and DET were averaged and used to annualize the radar data for VLL.

The resulting number of annual IFR GA operations at each airport was then divided by 365 to derive the number of AAD operations in 2004, the base year. GA operations for 2006 and 2011 were then calculated by multiplying the 2004 base year AAD operations by the TAF growth rate for GA operations between 2004 and 2006, and 2004 and 2011. GA operations were held constant at VLL, as no TAF is available for this airport. Additionally, no TAF was available for YQG (the FAA only prepares the TAF for domestic airports); therefore national level data from Transport Canada was used to project GA operations at YQG.[11]

The GA fleet mix for each airport was generated from the radar data, with some older GA aircraft types being replaced with newer similar aircraft in the 2011 event file. Before commencing the GA fleet mix forecast, all of the GA aircraft in the radar data were categorized based on their aircraft type—single-engine piston (SEP), multi-engine piston (MEP), turboprop (TP), or jet—and labeled accordingly. Once the GA aircraft were categorized, the FAA's Aerospace Forecast was used to project the growth for each type of aircraft—the GA aircraft were categorized because each of the four aircraft types has a different growth profile in the Aerospace Forecast.[12] For example, the Aerospace Forecast projects that growth in GA jets will far outpace that of TPs; therefore jet aircraft in the radar data were grown more quickly than TP aircraft. As a result, jets make up a larger share of the 2006 and 2011 GA fleet mix than they did in the 2004 radar data.

[10] ATADS data was queried for "instrument operations only" on the FAA website.

[11] Aviation Forecasts 2003-2017, Transport Canada, September 2004.

[12] *FAA Aerospace Forecasts*, March 2004, Table 32 – Active General Aviation and Air Taxi Hours Flow.

The resulting fleet mixes for 2006 and 2011 (expressed as a percent of total fleet) were applied to the projected number of GA operations at each airport in 2006 and 2011. The radar data was then used to assign origins and destinations and arrival and departure times to each GA flight.

D.4.3 All-Cargo Activity

Radar and ATADS data (of IFR aircraft operations) were used to help derive the cargo activity forecast; however, development of the cargo forecast also relied heavily on T-100 data. Once extrapolated to a full year, the 2004 ATADS data and the 2004 T-100 data were used to annualize the radar data for cargo operations. Note that annualizing the radar data for cargo operations is more complex than for the GA forecast because the ATADS data does not distinguish cargo operations from passenger operations. Rather, ATADS categorizes cargo operations based on aircraft size and classifies them as either air carrier (AC) or air taxi (AT) operations. For those airports with scheduled passenger service, OAG data was used to facilitate this breakout.

Once annualized, the annual number of IFR cargo operations was divided by 365 to derive the number of AAD operations in 2004. Cargo operations for 2006 and 2011 were then calculated by multiplying the 2004 base year AAD operations by the TAF growth rate for AC operations (or AT, as appropriate) between 2004 and 2006, and 2004 and 2011.

T-100 data and radar data were then used to develop the 2004 cargo fleet mix on an airline by airline basis. Fleet mix forecasts for 2006 and 2011 were developed based on aircraft orders, expected aircraft retirements, and cargo industry aircraft trends. The T-100 data and the radar data were used to determine origins and destinations for cargo flights in the event file and the radar data was used to assign arrival and departure times to these flights.

D.4.4 Air Taxi /Charter Activity

The methodology used to develop the base year and future year air taxi and charter activity levels was similar to that used to develop the cargo event files. This category of operations includes traditional “on demand” passenger air taxi/charter operators, including larger passenger charter airlines, classified as AC in the ATADS data, such as Ryan Air and USA 3000 (which primarily operate flights from the CLE/DTW region to places such as Las Vegas and cities in Florida and Mexico). Annualizing the radar data for the air taxi and charter operations was facilitated by the fact that all other operations—cargo, GA, and scheduled passengers operations—had already been subtracted from the ATADS data and, as a result, the “on demand” passenger air taxi/charter operations were readily distinguishable within the ATADS AC and AT categories. .

Once annualized, the IFR data for air taxi and charter operations was divided by 365 to arrive at the number of 2004 AAD operations for each category. Air taxi operations for 2006 and 2011 were then calculated by multiplying the 2004 base year AAD air taxi operations by the TAF growth rate for AT operations between 2004 and 2006 and 2004 and 2011. Projected charter operations in 2006 and 2011 were estimated in the same way but were grown using the TAF growth rate for AC operations at each airport.

Both radar data and T-100 data, along with information on aircraft orders and retirements, were used to develop the air taxi and charter fleet mix forecasts on and airline by airline basis.

Similarly, both data sources were used to assign origins and destinations and arrival and departure times to each air taxi and charter flight in the event file.

D.4.5 Military Activity

Per the TAF, military operations at each airport are held constant at their 2004 levels for the duration of the forecast. With the exception of a newer TEX2 (i.e., T-6A Texan II) aircraft replacing some older T37s in 2006 and 2011, the military aircraft fleet mix remains constant over the forecast period.

D.4.6 Overflights

Overflights in the study area were forecasted to provide input information for the noise modeling effort. Using the 2004 radar data sample of flights in the study area, aircraft flight events that did not depart or arrive at one of the 15 forecasted airports shown in Table 1 were identified as an 'overflight.' This provided a dataset of overflight operations by aircraft type, city pair, and daytime/nighttime (as needed for calculating DNL). Event records with incomplete data (e.g., missing aircraft type or city pair information, etc.) were re-distributed into the count of records that had complete data. This was accomplished by first by matching aircraft type if possible, and if not then in proportion to the overall dataset.

The dataset was annualized into an AAD value for 2004 using a ratio of annual operations to daily operations during the radar data period for airports in the study area.[13] Growth rates by city pair for 2006 and 2011 were calculated from the average of the total TAF-derived growth rates for each airport in the city pair; for airports without a TAF, the *FAA Aerospace Forecast* national growth rates were used. Using the growth rates, the 2006 and 2011 AAD overflights by aircraft type, city pair, and daytime/nighttime distribution were calculated in reference to the 2004 AAD overflight dataset.

For the 2004 AAD, there are an estimated 186 daily overflights. This increases to 194 daily overflights in 2006 and 210 daily overflights in 2011.

D.5 SUMMARY

Table D-2 displays total operations by category for each of the fifteen airports. 2004 AAD IFR operations estimates are shown in the top portion of the table followed by operation estimates for 2006 and 2011.

[13] Determined in reference to the 12 forecasted airports for which ATADS data is available: ARB, BKL, CAK, CGF, CLE, DET, DTW, FNT, MFD, PTK, TOL, YIP.

Table D-2
Forecast Summary

Airport	Scheduled Pax (a)	AT / Charter (b)	Cargo	GA	Military	Total
2004 AAD OPERATIONS						
CLE	626.0	10.8	41.8	33.6	-	712.2
DTW	1,346.0	12.0	32.6	39.3	-	1,429.9
CAK	78.0	1.8	22.2	95.9	15.4	213.3
FNT	74.0	0.8	8.6	71.8	-	155.2
TOL	64.0	3.6	35.4	52.3	7.4	162.7
YQG	14.2	6.0	7.7	10.6	-	38.5
YIP	-	2.1	67.2	60.6	-	129.9
BKL	-	1.2	25.2	36.8	1.0	64.2
CGF	-	-	-	54.4	-	54.4
ARB	-	-	-	11.4	-	11.4
DET	-	4.2	11.4	33.5	-	49.1
PTK	-	3.6	40.8	123.8	-	168.2
VLL	-	-	-	12.0	-	12.0
MTC	-	-	-	-	45.0	45.0
MFD	-	-	10.2	31.7	5.3	47.2
Total	2,202.2	46.0	303.1	667.7	74.1	3,293.1
2006 AAD OPERATIONS						
CLE	646.0	11.2	42.4	34.5	-	734.1
DTW	1,466.0	13.0	35.9	40.3	-	1,555.3
CAK	80.0	1.8	22.6	98.8	15.4	218.6
FNT	76.0	0.8	8.8	74.2	-	159.8
TOL	64.0	3.6	35.4	52.3	7.4	162.7
YQG	16.0	6.0	8.3	11.2	-	41.5
YIP	-	2.1	67.2	61.8	-	131.1
BKL	-	1.2	25.7	38.6	1.0	66.5
CGF	-	-	-	55.2	-	55.2
ARB	-	-	-	11.8	-	11.8
DET	-	4.2	11.4	33.7	-	49.3
PTK	-	3.6	40.8	126.6	-	171.0
VLL	-	-	-	12.0	-	12.0
MTC	-	-	-	-	45.0	45.0
MFD	-	-	10.2	32.1	5.3	47.6
Total	2,348.0	47.6	308.8	683.1	74.1	3,461.5
2011 AAD OPERATIONS						
CLE	696.0	12.1	44.0	36.9	-	788.9
DTW	1,668.0	14.9	41.0	43.1	-	1,766.9
CAK	84.0	1.9	23.6	106.0	15.4	231.0
FNT	78.0	0.9	9.2	80.2	-	168.3
TOL	66.0	3.7	35.4	52.3	7.4	164.8
YQG	18.0	6.0	9.7	12.5	-	46.1
YIP	-	2.1	67.2	64.8	-	134.1
BKL	-	1.2	27.1	43.0	1.0	72.3

Table D-2
Forecast Summary

Airport	Scheduled Pax (a)	AT / Charter (b)	Cargo	GA	Military	Total
CGF	-	-	-	57.1	-	57.1
ARB	-	-	-	12.7	-	12.7
DET	-	4.2	11.4	34.3	-	49.9
PTK	-	3.6	40.8	133.5	-	177.9
VLL	-	-	-	12.0	-	12.0
MTC	-	-	-	-	45.0	45.0
MFD	-	-	10.2	33.2	5.3	48.7
Total	2,610.0	50.6	319.6	721.5	74.1	3,775.8

Notes:
(a) Includes AC and Regional Carrier. AT category reflects only "true" for hire air taxi and small cargo.
(b) Reflects passenger "on demand" air taxi and all charter operations.

Sources: as noted in text.